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Attributions and behaviours of parents abused as children: a mediational analysis of the intergenerational continuity of child maltreatment (Part II)

Louise Dixon, Catherine Hamilton-Giachritsis, and Kevin Browne

Centre for Forensic and Family Psychology, School of Psychology, University of Birmingham, UK

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Abbreviated Title: parenting styles & mediational analysis of intergenerational child maltreatment

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Correspondence to

Louise Dixon, School of Psychology, University of Birmingham, Edgbaston, Birmingham, B15 2TT, UK; Email: LXD036@bham.ac.uk

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Background: This study extends previous research (Dixon, Browne, & Hamilton-Giachritsis, 2004) by exploring the mediational properties of parenting styles and their relation to risk factors in the intergenerational cycle of child maltreatment. Families with newborns where at least one of the parents was physically and/or sexually abused as a child (AP families) were compared, in terms of parents' attributions and behaviour, to families where the parents had no childhood history of victimisation (NAP families). **Methods:** Information was collected from 4351 families (135 AP families) by community nurses as part of the 'health visiting' service. The same health visitor visited each family twice at home when the child was 4 to 6 weeks and 3 to 5 months of age, to assess behavioural indicators of positive parenting. **Results:** Within 13 months after birth, 9 (6.7%) AP families were referred for maltreating their own child in comparison to 18 (.4%) NAP families. Assessments found a significantly higher number of risk factors and measures indicating poor parenting for AP families. Mediation analysis found that intergenerational continuity of child maltreatment was explained to a larger extent (62% of the total effect) by the presence of poor parenting styles together with the three significant risk factors (parenting under 21 years, history of mental illness or depression, residing with a violent adult). The three risk factors alone were less explanatory (53% of the total effect). **Conclusion:** This study provides an explanation for why a minority of parents abused in childhood go on to maltreat their own infant, evidencing poor parenting styles and mediating risk factors. Hence, prevention may be enhanced in AP families by the promotion of 'positive parenting' in addition to providing additional support to young parents, tackling mental illness/depression and domestic violence problems.

Keywords: Intergenerational continuity, risk factors, poor parenting, child abuse and neglect.

INTRODUCTION

The literature on attachment theory suggests that early experience with caregivers influences the development of later relationships (see Morton & Browne, 1998). More specifically, children develop a set of expectations about future interactions based on prior experiences with particular caregivers (Bowlby, 1980), including a model of themselves. This early mental representation of relationships is said to be the prototype for all future relationships (Bretherton, 1985, 1991). Thus, abused children may form a representation of their caregivers as unresponsive, rejecting and unavailable and of themselves as unworthy and unable to elicit the appropriate attention and care. They may also demonstrate problems adapting to other major developmental tasks, such as development of an autonomous self and forming interpersonal relations with their peers (Cicchetti & Lynch, 1993). Consequently, individuals with a history of maltreatment are at risk of becoming parents without having developed the skills for maintaining healthy relationships. They may have problems forming relationships with their own children and in developing secure attachment patterns to their romantic partners (Bartholomew, Henderson, & Dutton, 2001).

Furthermore, research suggests that an adult's attachment to their own parents (assessed retrospectively) corresponds to a large degree with the attachment status of their infant to them (see van IJzendoorn, 1995, for a review). This being the case, the precursors to insecure attachment should be visible in parents with a history of maltreatment in terms of poorer quality of parenting and interaction with their infants compared to non-abused caregivers. Indeed, Newcomb and Locke (2001) highlight research findings that demonstrate the link

between parenting practice and maltreatment and stress the need to integrate parenting practices into studies of the intergenerational cycle of abuse.

In Part I of this investigation, Dixon, Browne, and Hamilton-Giachritsis (2004) demonstrated that being a parent under the age of 21, having a history of mental illness or depression and/or living with a violent adult partially mediated the pathway between a parent having a history of child abuse and going on to maltreat their own infant. However, they noted the need for a secondary screening process to reduce the potential for identifying false alarms from using risk factors alone (see Browne, 1995a). Browne and Herbert (1997) hypothesised a multi-factor model of family violence, which proposes that risk factors are mediated through the interpersonal relationships within the family. Secure relationships will 'buffer' against the effects of stress (both past and present) and facilitate positive coping strategies. However, insecure attachments will not 'buffer' stress and episodic overload may result in maltreatment.

In support of Browne and Herbert's (1997) theoretical perspective, research over two decades has demonstrated that maltreating parents have poorer quality of interaction with their infants (Browne & Saqi, 1988a; Hyman, Parr, & Browne, 1979), more unrealistic expectations of their child (Putallaz, Costanzo, Grimes, & Sherman, 1998) and attribute more negative intentions to their child's behaviour in comparison to other parents (Zeanah & Zeanah, 1989). In addition, parental attributions have been related to how and whether a child will be abused (Stratton & Swaffer, 1988).

Therefore, Part II of the study explored the mediating properties of secure relationships (as indicated by positive attributions, realistic perceptions of the child, good quality of parenting and infant behaviour toward the caregiver) and their interplay with risk factors in the intergenerational cycle of maltreatment. Two groups were compared up to 13 months after the birth of a child: those families in which parents were physically and/or sexually abused in childhood (AP families) and those who were not (NAP families). The objective was to assess the prevalence of these behavioural indicators in the two groups as a measure of insecure relationships and examine their mediating properties on intergenerational transmission.

METHOD

Participants

Information was collected in the first 13 months of life on a population cohort of 4351 newborn children, born between 1 April 1995 and 30 June 1998, in Southend-on-Sea, Essex, England. Either the mother or her partner reported a history of physical and/or sexual maltreatment during their own childhood in 135 of these families (AP families); the remaining 4216 did not report such an abuse history (NAP families). There were no significant ethnicity or gender differences (see Dixon et al., 2004).

Procedures

All the information for this research was collected by 103 community nurses who made at least four home visits to all families with newborns during the first year, as part of the Child Assessment Rating Evaluation (CARE) programme. Part I of this investigation gives details of the CARE programme, training and main data collection (Dixon et al., 2004).

As part of the CARE programme (Browne, Hamilton, Hegarty, & Blissett, 2000; Hamilton & Browne, 2002), health visitors made a number of observations¹ regarding the parents' attributions, perceptions and interaction with their infant. The predetermined behavioural indicators used have previously been demonstrated to differentiate maltreating from non-maltreating families (Browne, 1986, 1995b). At both the 4- to 6-week and 3- to 5-month visits, health visitors made professional judgements about parental attributions and perceptions of infant behaviour based on discussions with the mother alone or both the mother and father². These observations were scored on a three-point scale from mostly positive and realistic to rarely positive and realistic. Additionally, at both of these visits the health visitor assessed the quality of care-giving via behavioural observation of the sensitivity, co-operation/supportiveness, accessibility and acceptance of the infant by the primary caregiver. These observations were scored on a three-point scale from 'frequently' to 'rarely'.

Finally, the health visitor observed early attachment behaviour of the infant toward the primary caregiver. At 4 to 6 weeks these behaviours included; infant smiling at the caregiver, infant quietens when picked up by the caregiver, infant responding to caregiver's voice, eye contact and scanning of caregiver's face, and infant settling in the caregiver's arms. At 3 to 5 months the infant behaviours observed were turning head to follow caregiver's movements, responding to caregivers voice with pleasure, imitation of speaking and preference for being held by the caregiver. All of these observations were scored on a three-point scale from 'frequently' to 'rarely'.

¹ The observation time was 30 minutes during a home visit lasting approximately 60 minutes.

² In the majority of cases the father was not present and professional judgement was based on discussion with mother. Although not ideal, this reflects the situations in which health visitors would have to apply this tool and make assessments for priority of services.

Throughout the first 13 months after birth, information was collated as to whether the child was referred to Child Protection professionals for suspected or actual physical, sexual or emotional child abuse and neglect. This is referenced as ‘Current Child Abuse and Neglect (CCAN)’ for the purpose of this study.

Treatment of data

Internal consistency

Kuber Richardson reliability coefficients were computed for each subscale of behavioural indicators. Internal consistency was high ($\alpha = .59 - .89$).

Dichotomising behavioural variables

For the purpose of data analysis each behavioural indicator was dichotomised due to the small number of responses in the extreme categories ($n = 25$). Therefore, responses of ‘occasionally’ and ‘rarely’ were grouped together. Tables 1a and 1b provide details of observations in this dichotomous format. A concatenated variable was then produced for each subscale of ‘positive attributions and realistic perceptions’, ‘quality of caregiving behaviours’ and ‘infant behaviours’ across time. This was achieved by firstly deriving subscales scores for each individual based on their dichotomous responses to each question within each subscale (scores 0 to 4 or 5) at both 4 to 6 weeks and 3 to 5 months. Secondly, corresponding subscale scores across time were then summed together to provide a total subscale score that ranged from 0 to 8 (0 to 9 for the ‘infant behaviour’ subscale). Total subscale scores were then dichotomised to reflect those parents who had always achieved positive measures across time (a score of 0) and those who had not (scores ≥ 1). In summary, three

binary variables represented the various behavioural measures taken over time for AP and NAP families.

Exploring the role of parenting styles

This part of the research expanded the initial mediational model (part I, Dixon et al., 2004) by exploring the effects of poor parenting in the intergenerational cycle of maltreatment. Again, the statistical procedure from Baron and colleagues (Baron & Kenny, 1986; Kenny, Kashy, & Bolger, 1998) was used (see part I, Dixon et al., 2004). The concatenated behavioural indicators were utilised. Inter-correlations between potential predictor variables were firstly computed to ensure that collinearity did not affect the logistic regression statistic. Phi correlation coefficients between the behavioural measures ranged from $-.14$ to $.34$ and between behavioural measures and risk factors from $-.01$ to $.21$. These coefficients were not deemed high enough to pose a problem to the logistic regression statistic. Again, variables are considered to be independent factors.

RESULTS

Characteristics of abused parents (AP) and non-abused parents (NAP) groups

As demonstrated in Part I (see Dixon et al, 2004), Fisher's Exact Probability Test revealed that the AP families were significantly more likely to maltreat their infant within 13 months after birth ($n = 9$, 6.7%) compared to the NAP families ($n = 18$, .4%; Fisher's Exact, $p < .001$). Of the 27 maltreated cases, 7 (25.9%) were referred for physical abuse, 5 (18.5%) emotional abuse, 1 (3.7%) sexual abuse, 9 (33.3%) neglect and 5 (18.5%) multiple abuse and

neglect. Numbers were too small to establish significant differences between AP and NAP families³.

At both 4 to 6 weeks and 3 to 5 months, significant differences were found between AP and NAP families in the majority of behavioural indicators. Interactions were frequently more positive in NAP families than AP families (Tables 1a & 1b). Only one of the observations at 4 to 6 weeks ('frequency of infant smiling at the caregiver') and one at 3 to 5 months ('shows a preference for being held by caregiver') failed to reach statistical significance.

The frequencies of the concatenated behavioural indicators used in the mediational model were calculated. Significant differences were found between AP and NAP families for 'positive attributions and realistic perceptions' ($\chi^2_1 = 59.712, p < .0001$) and 'quality of care giving behaviours' ($\chi^2_1 = 26.724, p < .0001$). It was found that 95% and 96% of NAP families demonstrated positive parenting responses in the two categories respectively, compared to 77% and 86% of AP families (respectively). 'Positive infant behaviours' over time did not reach significance.

(Table 1a & 1b here)

Mediational analysis

Establishing a mediating effect

The two concatenated variables that significantly differentiated between NAP and AP families were utilised for the analysis. 'Positive infant behaviours' was excluded from the

³ AP families: 2 neglect, 2 physical, 2 emotional and 3 mixed. NAP families: 7 neglect, 5 physical, 3 emotional, 2 mixed and 1 sexual.

mediational analysis as it did not discriminate between groups. For the purpose of further analysis, all possible independent variables (IV) were controlled in the regression equations. This ensured that relationships did not exist between a variable and a dependent variable (DV) simply because of the relationship the variable shares with an IV. For example, when exploring if current child abuse and neglect (CCAN; the DV) could be significantly regressed onto poor quality of caregiving behaviour (PQCB), factors that independently predict PQCB and CCAN are controlled for (namely ‘Parent Under 21, MI/Depression, Violent Adult and PChA’; Table 4). The effects of parenting styles on the intergenerational cycle of maltreatment were explored independently of risk factors in order to assert a mediational effect (Table 2).

Negative attributions and unrealistic perceptions (NA&UP)

As previous analysis had already established a significant predictive pathway between parental childhood history of abuse (PChA) and CCAN, the first step asserted that ‘negative attributions and unrealistic perceptions’ (NA&UP) could be regressed onto PChA directly (overall model significance test: $-2 \text{ Log } L, \chi^2_1 = 36.99, p < .0001$). Secondly, the effects of CCAN regressed onto NA&UP controlling for PChA was significant (overall model significance test: $-2 \text{ Log } L, \chi^2_2 = 26.01, p < .0001$). Finally, the mediational effects of NA&UP were determined by regressing CCAN onto PChA whilst controlling for the effects of NA&UP (steps 1 to 3, Table 2). Whilst β coefficients and odds ratios were reduced, the pathway was not decreased to a non-significant value (overall model significance test: $-2 \text{ Log } L, \chi^2_2 = 26.01, p < .0001$). The Sobel test statistic found NA&UP to be significantly partially mediating the intergenerational cycle of maltreatment ($z = 3.00, p < .01$).

Poor quality of caregiving behaviour (PQCB)

The same procedure was conducted with PQCB. The first step asserted that PQCB could be regressed onto PChA directly (overall model significance test: $-2 \text{ Log } L, \chi^2_1 = 17.99, p < .0001$). Secondly, the effects of CCAN regressed onto PQCB controlling for PChA was significant (overall model significance test: $-2 \text{ Log } L, \chi^2_2 = 40.07, p < .0001$). Finally, the mediational effects of PQCB in the pathway were determined by regressing CCAN onto PChA whilst controlling for the effects of PQCB (steps 4 to 6, Table 2). Whilst β coefficients and odds ratios were reduced, the pathway was not decreased to a non-significant value (overall model significance test: $-2 \text{ Log } L, \chi^2_2 = 40.07, p < .0001$). The Sobel test statistic also found PQCB to be significantly partially mediating the intergenerational cycle of maltreatment ($z = 27.30, p < .0001$). The effects of controlling for NA&UP and PQCB simultaneously are also depicted in Table 2 (step 7). The percentage of the total effects was only increased by a fraction of what NA&UP accounted for alone (18.5% in comparison to 18.1% respectively).

(Table 2 here)

Risk factors in relation to negative attributions and unrealistic perceptions

Tables 3a and 3b demonstrate the combined mediating effects of risk factors in the pathway between PChA and NA&UP and PChA and PQCB respectively.

NA&UP was significantly regressed onto PChA directly, thus a pathway exists which could be mediated (step 1, Table 3a). As it had already been determined that the three risk factors could be significantly regressed onto PChA (Dixon et al, 2004), this analysis considered

whether NA&UP could be regressed onto each risk factor independently, whilst controlling for any effects of PChA. Logistic regression analysis found significant results for each equation (step 2, Table 3a); Parent Under 21 predicting NA&UP (overall model significance test: $-2 \text{ Log L}, \chi^2_2 = 41.59, p < .0001$); MI/depression predicting NA&UP (Overall model significance test: $-2 \text{ Log L}, \chi^2_2 = 44.85, p < .0001$); Violent Adult predicting NA&UP (overall model significance test: $-2 \text{ Log L}, \chi^2_2 = 91.63, p < .0001$). Finally, the effects of controlling for each mediator independently in the pathway between PChA and NA&UP were calculated (step 3, Table 3a). Whilst all β coefficients and odds ratios were reduced in size, the pathway was not reduced to a non-significant level; Controlling for Parent Under 21 (overall model significance test: $-2 \text{ Log L}, \chi^2_2 = 41.59, p < .0001$); Controlling for MI/Depression (overall model significance test: $-2 \text{ Log L}, \chi^2_2 = 44.85, p < .0001$); Controlling for Violent Adult (overall model significance test: $-2 \text{ Log L}, \chi^2_2 = 91.63, p < .0001$).

The Sobel test statistic examined the independent effects of risk factors in the pathway. All three variables (Parent Under 21: $z = 2.06, p < .05$; Mental Illness/Depression: $z = 2.87, p < .01$; Violent Adult: $z = 5.93, p < .0001$) were found to significantly partially mediate the effect of PChA and NA&UP. Thus, each variable provides partial mediation between parental childhood abuse and negative attributions and unrealistic perceptions of their infant. In addition, the effects of controlling for all three risk factors in succession was computed. Again, this did not provide full mediation of the pathway (overall model significance test: $-2 \text{ Log L}, \chi^2_4 = 98.12, p < .0001$), but odds ratios were reduced from 5.16 to 2.88 (Table 3a).

(Table 3a here)

Risk factors in relation to poor quality of caregiving behaviour

PQCB was significantly regressed onto PChA directly, thus a pathway exists that can be mediated (step 1, Table 3b). The analysis considered whether PQCB could be regressed onto each risk factor independently, whilst controlling for any effects of PChA (step 2, Table 3b). Logistic regression analysis found significant results for each equation: Parent Under 21 predicting PQCB (overall model significance test: $-2 \text{ Log } L, \chi^2_2 = 32.30, p < .0001$); MI/depression predicting PQCB (overall model significance test: $-2 \text{ Log } L, \chi^2_2 = 42.80, p < .0001$); Violent Adult predicting PQCB (overall model significance test: $-2 \text{ Log } L, \chi^2_2 = 48.46, p < .0001$). Finally, the effects of controlling for each mediator independently in the pathway between PChA and PQCB were calculated (step 3, Table 3b). Whilst all β coefficients and odds ratios were reduced in size, the pathway was not reduced to non-significant levels; Controlling for Parent Under 21 (overall model significance test: $-2 \text{ Log } L, \chi^2_2 = 32.30, p < .0001$); Controlling for MI/Depression (overall model significance test: $-2 \text{ Log } L, \chi^2_2 = 42.80, p < .0001$); Controlling for Violent Adult (overall model significance test: $-2 \text{ Log } L, \chi^2_2 = 48.46, p < .0001$).

The Sobel test statistic examined the independent effects of mediators on the intergenerational cycle of maltreatment. All three variables (Parent Under 21: $z = 3.14, p < .01$; Mental Illness/Depression: $z = 5.02, p < .0001$; Violent Adult: $z = 5.13, p < .0001$) were found to significantly partially mediate the effect of PChA and PQCB. Thus, each variable provides partial mediation between parental childhood abuse and a poor quality of caregiving behaviours toward their infant. In addition, the effects of controlling for all three risk factors in succession were computed (step 4, Table 3b: overall model significance test: $-2 \text{ Log } L, \chi^2_4$

= 80.97, $p < .0001$). This model reduced the direct pathway between PChA and PQCB to non-significant levels, thus providing full mediation and 65.89% of the total effect.

(Table 3b here)

The influence of risk factors and poor parenting on current child maltreatment

The final stage was to explore whether each parenting style mediated the effect of each risk factor on CCAN. Previous analysis had already established a significant direct pathway between each of the 3 risk factors and CCAN (Dixon et al., 2004) and a significant direct pathway between each risk factor and parenting style (Tables 2a & 2b). Therefore, the next stage of the analysis was to determine if CCAN could be regressed onto each parenting style independently, whilst controlling for any effects of risk factors and PChA. Logistic regression analysis determined a significant pathway for NA&UP predicting CCAN (overall model significance test: $-2 \text{ Log L}, \chi^2_5 = 51.37, p < .0001$).

The effects of controlling for NA&UP in the pathway between each risk factor and CCAN were calculated (Table 4, steps 1 to 4). Examining the mediating properties of NA&UP for Parent Under 21 predicting CCAN (overall model significance test: $-2 \text{ Log L}, \chi^2_3 = 31.23, p < .0001$) and MI/Depression predicting CCAN (overall model significance test: $-2 \text{ Log L}, \chi^2_3 = 37.57, p < .0001$) demonstrated that NA&UP actually increased the variance. Thus, NA&UP is associated with variables not accounted for in this model that introduce further variance. The Sobel test statistic demonstrated that NA&UP did not significantly mediate either pathway (Parent Under 21 predicting CCAN: $z = 1.63, p > .05$; Mental Illness/Depression predicting CCAN: $z = 1.83, p > .05$). However, regarding Violent Adult predicting CCAN

(overall model significance test: $-2 \text{ Log L}, \chi^2_3 = 36.01, p < .0001$), β coefficients and odds ratios were reduced in size. As the pathway was not reduced to a non-significant level, the Sobel test statistic examined the independent effects of NA&UP on the pathway ($z = 2.24, p < .05$) which was found to significantly partially mediate the effect of Violent Adult and CCAN.

(Table 4 here)

Logistic regression analysis determined a significant pathway between PQCB and CCAN (overall model significance test: $-2 \text{ Log L}, \chi^2_5 = 75.38, p < .0001$). The effects of controlling for each parenting style in the pathway between each risk factor and CCAN are shown in steps 6 to 8, Table 4. Examining the mediating properties of PQCB for Parent Under 21 predicting CCAN (overall model significance test: $-2 \text{ Log L}, \chi^2_3 = 48.85, p < .0001$) revealed no change in the test statistics. For pathways MI/Depression predicting CCAN (overall model significance test: $-2 \text{ Log L}, \chi^2_3 = 56.47, p < .0001$) and Violent Adult predicting CCAN (overall model significance test: $-2 \text{ Log L}, \chi^2_3 = 50.06, p < .0001$) β coefficients and odds ratios were reduced. The Sobel test statistic demonstrated that PQCB did not significantly mediate any pathway (Parent Under 21 predicting CCAN: $z = 1.81, p > .05$; Mental Illness/Depression predicting CCAN: $z = 1.89, p > .05$; Violent Adult predicting CCAN: $z = 1.91, p = .056$). However, whilst the pathway of Violent Adult predicting CCAN was not significant, a trend was demonstrated. Controlling for the combined effects of both parenting styles in the above pathways had no additional effects in the percentage of the total effect explained (steps 9 to 11, Table 4).

Complete model

Finally, the effect of controlling for all factors in the pathway between PChA and CCAN was computed (overall model significance test: $-2 \text{ Log } L, \chi^2_6 = 56.4752.54, p < .0001$; step 12, Table 4). When controlling for the variance accounted by all three risk factors and both parenting styles the pathway was reduced to a non-significant level (Figure 1). Thus, together these factors provide full mediation of the intergenerational cycle of abuse and account for 61.57% of the total effect and the model itself accounts for 27.5% of the overall variance.

(Figure 1 here)

DISCUSSION

This study has shown that more parents with a history of childhood abuse demonstrate poor parenting in comparison to parents without such a history. Part I of this research (Dixon et al., 2004) also demonstrated that parents with a history of childhood abuse had a higher number of risk factors associated with child maltreatment and intergenerational transmission. In terms of mediation, being a parent under the age of 21, having a history of mental illness or depression and/or living with a violent adult were found to partially mediate this cycle (53% of the total effect). This study has found that poor parenting also partially mediates the intergenerational cycle of child maltreatment, although to a lesser extent than the three risk factors (18.5% of the total effect). However, including *both* risk factors and parenting styles in the model provides ‘full’ mediation of the intergenerational cycle of maltreatment (62% of the total effect). Thus, considered together, the results of the present study provide evidence

of the mechanisms by which an abusive childhood may result in an increased likelihood of maltreatment being transmitted from one generation to the next.

Parenting and infant behaviour

This greater number of risk factors and indicators of poor parenting in parents with a history of childhood abuse (AP families) may be associated with difficulties in parental bonding and relationship with the child. This is in accordance with previous research (Putallaz et al., 1998; Zeanah & Zeanah, 1989) that has also found negative perceptions and attributions as significant factors in the intergenerational transmission of child maltreatment. Furthermore, negative perceptions and attributions and less reciprocal insensitive parent-child interaction is commonly observed in abusing parents (e.g., Stratton & Swaffer, 1988; Browne & Saqi, 1988a).

Less sensitive care-giving impacts on infant behaviour and is said to lead to patterns of insecure attachment from infant to parent (Ainsworth, Blehar, Waters, & Wall, 1978; Belsky, Rovine, & Taylor, 1984; Browne & Saqi, 1988a; Egeland & Farber, 1984; Grossman, Grossman, Spangler, Suess, & Unzer, 1985). Indeed, some models attempt to explain the transmission of abuse across generations on the basis of insecure attachments (see Egeland, Bosquet, & Chung, 2002; Morton & Browne, 1998 for reviews). However, observations on the development of infant attachment behaviours in this investigation showed marginal results, with AP families showing some significantly less positive infant behaviours at 4 to 6 weeks and 3 to 5 months. No significant difference was found, between AP and NAP families, for 'infant smiles at caregiver' at 4 to 6 weeks and 'infant shows preference for being held by caregiver at 3 to 5 months'. When infant behaviour was concatenated there

were no overall difference between the two groups. This may suggest that, in the early stages of infant behavioural development, infants show some resilience in their behavioural responses to poor parenting. It may take more than five months of non-reinforcing interaction with the parent before infant attachment behaviours show signs of insecurity. Observational studies that measure the quality of infant attachment (secure versus insecure) are conducted on children around 12 months of age (e.g., Ainsworth et al., 1978; Browne & Saqi, 1988a).

Parental history of childhood abuse to poor parenting, mediated by risk factors

In AP families, it was found that the risk factors influenced the parents' behaviour. The factor most likely to partially mediate between a parent abused as a child and the parent having negative attributions and unrealistic perceptions (NA&UP) was a violent adult in the family home, followed by a history of mental illness and depression. Parent under 21 had the least influence on this pathway. With regard to poor quality of caregiving behaviour (PQCB), a history of mental illness/depression had the most effect, followed by violent adult present in the family home. Again, parent under 21 had the least influence on this pathway.

Risk factors to current child maltreatment, mediated by parenting styles

Negative attributions and unrealistic perceptions (NA&UP) were found to significantly partially mediate the pathway between violent adult in the family home and current child abuse and neglect (CCAN). Poor quality of caregiving behaviour (PQCB) also demonstrated a similar trend to partially mediate this pathway. The model therefore highlights the link between child maltreatment and violence between adults in the home, confirming previous research that indicates domestic violence as a strong predictor of child maltreatment (Browne

& Saqi, 1998b; Browne & Herbert, 1997; Browne & Hamilton, 1999). Pathways involving poor parenting as a mediator between the other two risk factors and CCAN were not found. This suggests that other factors associated with parenting, such as attitude, impulsivity or coping style, may be relevant to a model of intergenerational transmission.

Future models will need to account for mediating factors from other theoretical perspectives, such as the genetic components of temperament and personality that may also contribute to intergenerational transmission (Farrington, Joliffe, Loeber, & Stouthamer-Loeber, 2001). An ecological perspective, first proposed by Bronfenbrenner (1979), would include characteristics from the child, family, community and society as a whole, which have been identified in the aetiology of child abuse (Cicchetti & Lynch, 1993). Furthermore, research should consider protective as well as destabilising factors at each ecological level in order to develop a complete model that explains more than 62% of the intergenerational transmission of abuse.

Methodological considerations

Health visitors have a wealth of professional knowledge and experience of how to observe and interpret parent-infant interactions. Nevertheless, in this study, health visitor observations of parent-child interaction in the home were standardised and operationally defined. They also received training on the use of behavioural indicators to further promote high reliability in identifying poor parenting. This reliability was reflected in the Alphas for each behavioural subscale. It was felt important to use observational methods to assess families in order to supplement self-report data. Observations are less susceptible to social desirability effects

(Krishnakumar & Buehler, 2000). Thus, utilising both techniques for data collection increases the validity of the findings (see Browne, 1986).

It could be argued that a parent's disclosure of a history of childhood maltreatment could lead to the health visitor making biased observations. However, health visitors and families completed the checklists together, in keeping with the notion of 'partnership' in the Children Act (1989). Therefore, responses were not based solely on the health visitor's judgement. Furthermore, the majority of parents who disclosed childhood abuse were rated as having positive interactions. This suggests that the quality of interaction rather than the history of a particular family influenced health visitor's ratings. At the time the observations were carried out on both groups of families, the health visitors were unaware of whether the family would be later referred for current child maltreatment.

Using health visitors for data collection does have some limitations, as separate data on fathers was not practically available or feasible. This accurately reflects the information available to community nurses during home visits, when they are making important decisions about the family referrals and their access to services. Therefore, the findings and their implications for assessing risk to children during home visits by community nurses are ecologically valid.

Conclusion

Parents with a history of childhood abuse (AP families) were found to have a greater chance of being a parent under 21 years, having a history of mental illness or depression and residing with a violent adult (see Part I, Dixon et al., 2004). This in turn increased the likelihood of

poor parenting styles indicated by negative attributions, unrealistic perceptions and poor quality of care-giving. Thus, together the three significant risk factors and poor parenting styles demonstrated ‘full’ mediation of the intergenerational cycle of abuse within the first 13 months of the infant’s life, accounting for 62% of the total effect. The presence of these variables makes parents with a history of childhood abuse 17 times more likely to abuse their own children in comparison to parents without such a history. Hence, prevention may be enhanced in AP families by the promotion of ‘positive parenting’ in addition to providing additional support to young parents, tackling mental illness/depression and domestic violence problems.

However, this study showed that the vast majority of parents abused in childhood (93.3%) did not maltreat their own infant. Indeed, AP families have a higher prevalence of poor parenting styles and risk factors in comparison to NAP families. However, it is important to discriminate between those AP families who go onto maltreat their infant and those who break the cycle in order to explore protective as well as destabilising factors of intergenerational transmission (Egeland et al., 2002). It is suggested that the majority of AP families who break the cycle have a lower prevalence of risk factors and poor parenting styles and other additional protective mechanisms, in comparison to AP families who do not (see Dixon, Hamilton-Giachritsis, & Browne, forthcoming).

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Table 1a: The prevalence of positive behavioural indicators displayed by abused parent families (AP) and non-abused parent families (NAP) at 4 to 6 weeks

Behavioural indicator ¹	AP ² n/N (%) ²	NAP ² n/N (%) ²	Test Statistic ³ (df = 1)
Positive attributions and realistic perceptions at 4 to 6 weeks			
Mother's attributions regarding infant	119/131 (91%)	4025/4150 (97%)	Fisher's Exact < .001 **
Father's attributions regarding infant	96/119 (81%)	3685/3885 (95%)	$\chi^2_1 = 44.147, p < .0001$ **
Mother's perceptions of infant	114/131 (87%)	4025/4148 (97%)	Fisher's Exact < .0001 **
Father's perceptions of infant	97/119 (82%)	3672/3885 (95%)	$\chi^2_1 = 35.346, p < .0001$ **
Positive quality of caregiving behaviours at 4 to 6 weeks			
Sensitivity	124/131 (95%)	4043/4112 (98%)	Fisher's Exact < .01 **
Supportiveness/Cooperativeness	121/129 (93%)	4034/4098 (98%)	Fisher's Exact < .0001 **
Accessibility	121/129 (94%)	4008/4086 (98%)	Fisher's Exact < .005 **
Acceptance	117/129 (91%)	4012/4116 (97%)	Fisher's Exact < .0001 **
Positive infant behaviours at 4 to 6 weeks			
Infant smiles at caregiver	101/128 (79%)	3485/4112 (85%)	$\chi^2_1 = 3.252, p = 0.071$
Infant quietens when picked up by caregiver	117/129 (91%)	4029/4146 (97%)	Fisher's Exact < .0001 **
Infant responds to Caregiver's face	116/128 (91%)	3996/4144 (96%)	Fisher's Exact < .005 **
Infant eye contact and scanning	118/129 (91%)	4034/4144 (97%)	Fisher's Exact < .001 **
Infant settles in Caregiver's arms	117/129 (91%)	4049/4147 (98%)	Fisher's Exact < .0001 **

¹For an explanation of the behavioural indicator see method.

² The initial figure refers to the number of parents who participated in that positive behaviour, the second is the *N* size of that group.

³** $p < .01$

Table 1b: The prevalence of positive behavioural indicators displayed by abused parent (AP) and non-abused parent families at 3-5 months

Behavioural indicator ¹	AP ² n/N (%) ²	NAP ² n/N (%) ²	Test Statistic ³ (df = 1)
Positive attributions and realistic perceptions at 3 to 5 months			
Mother's attributions regarding infant	123/132 (93%)	4023/4076 (99%)	Fisher's Exact < .0001 **
Father's attributions regarding infant	100/122 (82%)	3629/3769 (96%)	$\chi^2_1 = 60.719, p < .0001$ **
Mother's perceptions of infant	122/133 (91%)	4045/4094 (99%)	Fisher's Exact < .0001 **
Father's perceptions of infant	106/124 (85%)	3685/3844 (96%)	$\chi^2_1 = 30.369, p < .0001$ **
Positive quality of caregiving behaviours at 3–5 months			
Sensitivity	127/134 (95%)	4036/4071 (99%)	Fisher's Exact < .0001 **
Supportiveness/Cooperativeness	125/134 (93%)	4040/4071 (99%)	Fisher's Exact < .0001 **
Accessibility	127/134 (95%)	4017/4064 (99%)	Fisher's Exact < .001 **
Acceptance	126/134 (94%)	4032/4089 (99%)	Fisher's Exact < .001 **
Positive infant behaviours at 3–5 months			
Infant turns head to follow caregiver	124/133 (93%)	4032/4102 (98%)	Fisher's Exact < .001 **
Infant responds to caregiver's voice with pleasure	121/133 (91%)	3986/4100 (97%)	Fisher's Exact < .001 **
Infant imitates speaking to caregiver	118/133 (89%)	3872/4100 (94%)	$\chi^2_1 = 7.782, p < .005$ **
Infant shows preference for being held by caregiver	124/133 (93%)	3897/4097 (97%)	$\chi^2_1 = 3.52, p = .323$

¹For an explanation of the behavioural indicator see method.

² The initial figure refers to the number of parents who participated in that positive behaviour, the second is the N size of that group.

³** $p < .01$

Table 2: Logistic regression analysis assessing the mediating effects of poor parenting styles (concatenated variables NA&UP and PQCB) on the intergenerational cycle of maltreatment

Equation Variables ^{1 2 4}	Nagelkerke R ^{2 3}	$\beta^{3 5}$	SE ³	% of total effect explained ³	Odds ³ Ratio (EXP(B))	95% Confidence Intervals for EXP (B) ³	
						Lower	Upper
STEP:							
1.PChA → NA&UP (direct pathway)		1.64**	.24		5.16	3.23	8.18
2.NA&UP → CCAN (controlling for PChA)		1.91**	.57		6.74	2.20	20.65
3.PChA → CCAN (controlling for NA&UP)	.136	2.30**	.60	18.15	9.95	3.10	32.12
4.PChA → PQCB (direct pathway)		1.29**	.27		3.63	2.15	6.11
5.PQCB → CCAN (controlling for PCHA)		1.67**	.47		5.23	2.08	13.41
6.PChA → CCAN (controlling for PQCB)	.132	2.62**	.49	6.76	13.71	5.80	32.40
7.PChA → CCAN (controlling for NA&UP and PQCB)	.143	2.29**	.61	18.50	9.29	2.82	30.60

¹PChA = Parental childhood abuse; CCAN = Current child abuse and neglect; NA&UP = negative attributions and unrealistic perceptions of the infant at both 4 to 6 weeks and 3 to 5 months; PQCB = Poor quality of care giving behaviour toward the infant at both 4 to 6 weeks and 3 to 5 months

²For explanation of the behavioural indicators see method

³For explanation of statistical terms see treatment of data section in Part I (Dixon, Browne & Hamilton-Giachritsis, 2004)

⁴For explanation of 'controlling for IV's' see results section

⁵** $p < .01$

Table 3a: Logistic regression analysis assessing the mediating effects of risk factors in the pathway of parental childhood abuse (PChA) predicting negative attributions and unrealistic perceptions at both 4 to 6 weeks and 3 to 5 months (NA&UP)

Equation Variables ^{1 2 4}	$\beta^{3 5}$	SE ³	% of total effect explained ³	Odds ³ ratio (EXP(B))	95% Confidence Intervals for EXP (B) ³	
					Lower	Upper
STEP:						
1.PChA → NA&UP (direct pathway)	1.64**	.24		5.16	3.23	8.18
2.Parent Under 21 → NA&UP (controlling for IV's)	.58*	.25		1.78	1.08	2.94
MI/Depression → NA&UP (controlling for IV's)	.60**	.21		1.83	1.22	2.73
Violent Adult → NA&UP (controlling for IV's)	2.75**	.35		15.71	7.93	31.13
3.PChA → NA&UP (controlling for Parent Under 21)	1.59**	.24	3.05%	4.89	3.07	7.79
PChA → NA&UP (controlling for MI/Depression)	1.41**	.25	14.02%	4.08	2.49	6.67
PChA → NA&UP (controlling for Violent Adult)	1.23**	.27	25.00%	3.41	2.02	5.74
4.PChA →NA&UP (controlling for all 3 risk factors)	1.06**	.28	35.37%	2.88	1.68	4.94

¹PChA = Parental childhood abuse; CCAN = Current child abuse and neglect; NA&UP = negative attributions and unrealistic perceptions of the infant at both 4 to 6 weeks and 3 to 5 months.

²For explanation of the behavioural indicators see method

³For explanation of statistical terms see treatment of data section in Part I (Dixon, Browne & Hamilton-Giachritsis, 2004)

⁴For explanation of 'controlling for IV's' see results section

⁵** $p < .01$

Table 3b: Logistic regression analysis assessing the mediating effects of risk factors in the pathway of parental childhood abuse (PChA) predicting a poorer quality of care giving behaviour 4 to 6 weeks and 3 to 5 months (PQCB)

Equation Variables ^{1 2 4}	$\beta^{3 5}$	SE ³	% of total effect explained ³	Odds ratio (EXP(B)) ³	95% Confidence Intervals for EXP (B) ³	
					Lower	Upper
STEP:						
1.PChA → PQCB (direct pathway)	1.29**	.27		3.63	2.15	6.11
2.Parent Under 21 → PQCB (controlling for IV's)	.92**	.22		2.51	1.62	3.87
MI/Depression → PQCB (controlling for IV's)	1.07**	.20		2.92	1.98	4.30
Violent Adult → PQCB (controlling for IV's)	2.22**	.35		9.16	4.58	18.32
3.PChA → PQCB (controlling for Parent Under 21)	1.18**	.27	8.53%	3.26	1.92	5.54
PChA → PQCB (controlling for MI/Depression)	.80**	.29	37.98%	2.22	1.26	3.90
PChA → PQCB (controlling for Violent Adult)	.88**	.3	31.78%	2.41	1.35	4.31
4.PChA → PQCB (controlling for all 3 risk factors)	.44 NS	.31	65.89%	1.55	.85	2.82

¹PChA = Parental childhood abuse; CCAN = Current child abuse and neglect; PQCB = Poor quality of care giving behaviour toward the infant at both 4 to 6 weeks and 3 to 5 months

²For explanation of behavioural indicators see method.

³For explanation of statistical terms see treatment of data section in Part I (Dixon, Browne & Hamilton-Giachritsis, 2004)

⁴For explanation of 'controlling for IV's' see results section

⁵** $p < .01$

Table 4: Logistic regression analysis assessing the mediational effects of poor parenting in the pathway of risk factors predicting current child abuse and neglect (CCAN) and in the intergenerational cycle of maltreatment

Equation Variables ^{1 2}	Nagelkerke ³ R ²	$\beta^{3 4}$	SE ³	% of total effect explained ³	Odds ratio (EXP(B)) ³	95% Confidence Intervals for EXP (B) ³	
						Lower	Upper
1. NA&UP → CCAN (controlling for IV's)		1.44*	.62		4.22	1.26	14.14
2.Parent Under 21 → CCAN (controlling for NA&UP and IV's).		1.60**	.62	↑6.67%	4.93	1.48	16.48
3.MI/Depression → CCAN (controlling for NA&UP and IV's).		1.99**	.56	↑1.53%	7.31	2.44	21.89
4.Violent Adult → CCAN (controlling for NA&UP and IV's).		2.58**	.78	4.09%	13.19	2.88	60.34
5.PQCB → CCAN (controlling for IV's)		1.02*	.51		2.77	1.03	7.47
6.Parent Under 21 → CCAN (controlling for PQCB and IV's).		1.50**	.48	0%	4.58	1.83	10.94
7.MI/Depression → CCAN (controlling for PQCB and IV's).		1.90**	.45	3.06%	6.66	2.76	16.1
8.Violent Adult → CCAN (controlling for PQCB and IV's)		2.10**	.60	21.93%	8.16	2.51	26.48
9.Parent Under 21 → CCAN (controlling for both NA&UP and PQCB and IV's).		1.66**	.62	↑10.67%	5.26	1.56	17.45
10.MI/Depression → CCAN (controlling for both NA&UP and PQCB and IV's).		1.96**	.56	0%	7.11	2.37	21.33
11.Violent Adult → CCAN (controlling for both NA&UP and PQCB and IV's).		2.54**	.77	5.58%	12.65	2.77	57.73
12.PChA → CCAN (controlling for all 3 risk factors, NA&UP and PQCB).	.275	1.10**	.65	61.57%	3.016	.84	10.83

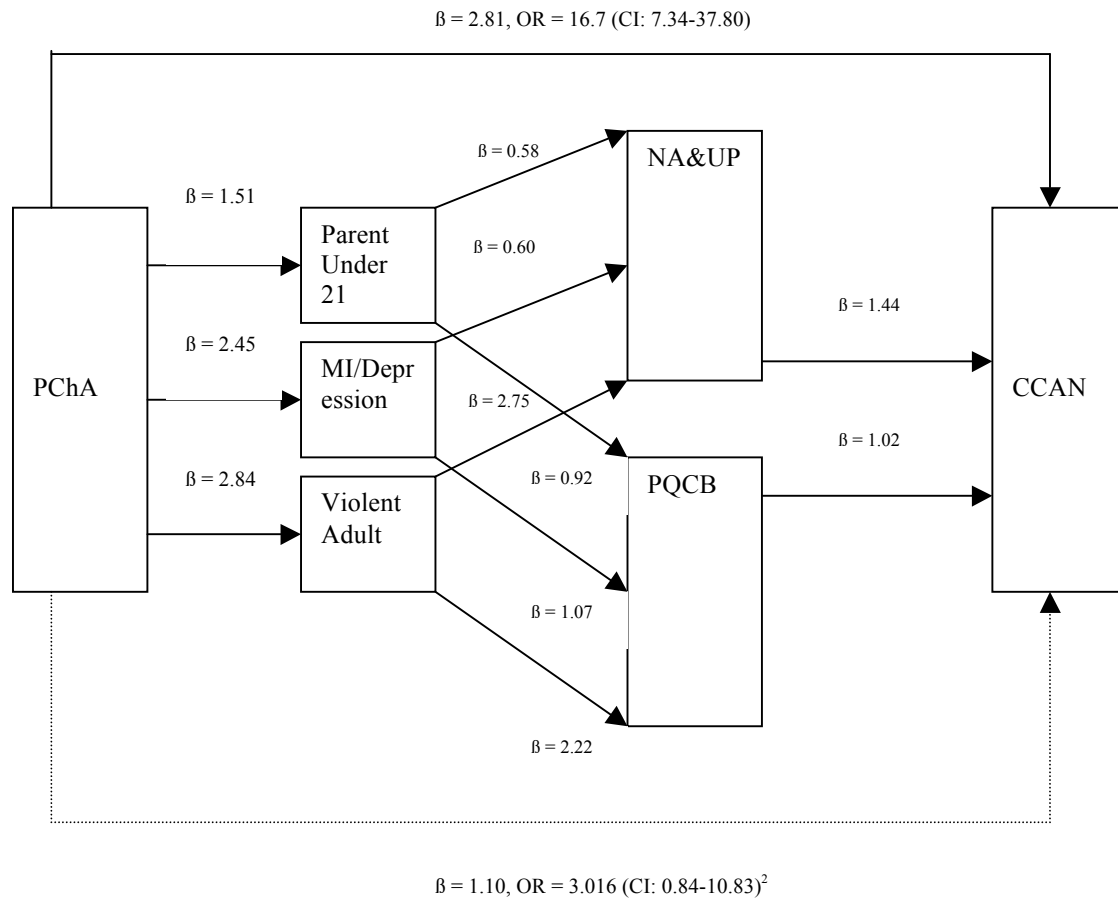
¹PChA = Parental childhood abuse; NA&UP = Negative attributions and unrealistic perceptions of the infant at both 4 to 6 weeks and 3 to 5 months; PQCB = Poor quality of care giving behaviour toward the infant at both 4 to 6 weeks and 3 to 5 months;

³For explanation of statistical terms see treatment of data section in Part I (Dixon, Browne & Hamilton-Giachritsis, 2004)

⁴For explanation of 'controlling for IV's' see results section

^{*} $p < .05$; ^{**} $p < .01$; ↑ = the regression in question actually increases the percentage of the total effect unaccounted for.

Figure 1: Complete model of the mediating role of risk factors and poor parenting in the intergenerational cycle of maltreatment¹.



¹See Tables 2, 3a, 3b & 4 for Nagelkerke R^2 , SE, % of total effect explained, odds ratios and their 95% confidence intervals.

²Variables provide full mediation of the intergenerational cycle of maltreatment